CLAIMS

1. A method of releasing a micro-electronic device formed over an insulator of a silicon-on-insulator (SOI) substrate, comprising:

etching at least a portion of the insulator to separate the micro-electronic device from the SOI substrate;

rinsing at least the micro-electronic device; and

exposing at least the micro-electronic device to a micro-sphere solution.

2. The method of Claim 1 further comprising removing the micro-electronic device from the SOI substrate after exposing the micro-electronic device to the micro-sphere solution.

3. The method of Claim 1 wherein the insulator is etched by an etching solution comprising HF.

4. The method of Claim 1 wherein the rinsing includes rinsing in de-ionized water.

5. The method of Claim 1 wherein the rinsing includes a first rinse to arrest the etching and a second rinse to substantially expunge an etching solution.

6. The method of Claim 1 wherein the micro-sphere solution comprises micro-spheres having a diameter ranging between about 0.1 μm and about 2.0 μm.

7. The method of Claim 1 wherein the micro-sphere solution comprises polystyrene micro-spheres.

8. The method of Claim 1 wherein the micro-sphere solution comprises silica micro-spheres.

9. The method of Claim 1 wherein the micro-sphere solution comprises polystyrene micro-spheres suspended in an isopropyl alcohol solution at a concentration ranging between about 0.5% and about 5.0%, by volume.

10. The method of Claim 1 wherein the micro-electronic device is exposed to the micro-sphere solution for at least 20 minutes.

11. The method of Claim 1 further comprising exposing the micro-electronic device to an etching plasma to substantially expunge the micro-sphere solution.

12. The method of Claim 11 wherein the etching plasma comprises an oxygen constituent and a forming gas constituent.

13. The method of Claim 12 wherein the forming gas constituent comprises N_2-H_2 and the micro-electronic device is exposed to the oxygen constituent at an oxygen flow rate ranging between about 25 sccm and about 75 sccm and concurrently exposed to the forming gas constituent at a forming gas flow rate ranging between about 5 sccm and about 15 sccm.

14. The method of Claim 11 wherein the etching plasma is generated by an RF signal power ranging between about 400 watts and about 600 watts.

15. The method of Claim 1 further comprising exposing the micro-electronic device to an etching gas to substantially expunge the micro-sphere solution.

16. The method of Claim 1 wherein the micro-electronic device is a micro-electromechanical device having feature dimensions less than about 1000 microns.

17. The method of Claim 1 wherein the micro-electronic device is a nano-electromechanical device having feature dimensions less than about 10 microns.

18. A method of manufacturing a micro-electronic device, comprising:

providing a substrate having an insulator layer located over a bulk substrate and a device layer located over the insulator layer;

forming a micro-electronic device in the device layer;

etching the insulator layer to separate the micro-electronic device from the bulk substrate;

rinsing at least the micro-electronic device; and

exposing at least the micro-electronic device to a micro-sphere solution.

19. The method of Claim 18 further comprising removing the micro-electronic device from the substrate.

20. The method of Claim 18 wherein the bulk substrate, insulator layer and device layer are collectively a silicon-on-insulator substrate.

21. The method of Claim 18 wherein the micro-electronic device is a nano-electronic device having feature dimensions less than about 10 microns.

22. The method of Claim 18 further comprising exposing the micro-electronic device to an etching plasma to substantially expunge the micro-sphere solution.

23. The method of Claim 22 wherein the etching plasma comprises an oxygen constituent and an N_2-H_2 constituent.

24. The method of Claim 18 further comprising exposing the micro-electronic device to an etching gas to substantially expunge the micro-sphere solution.

25. A system for releasing a micro-electronic device formed over an SOI substrate insulator, comprising:

means for etching the insulator to separate the micro-electronic device from the SOI substrate;

means for rinsing at least the micro-electronic device;

means for exposing at least the micro-electronic device to a micro-sphere solution; and means for exposing the micro-electronic device to an etching environment to substantially expunge the micro-sphere solution.

26. The system of Claim 25 wherein the etching environment comprises an etching gas.

27. The system of Claim 25 wherein the etching environment comprises an etching plasma.